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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/921,070	08/02/2001	Joseph C. Barrett	42390.P4934D2	7988

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EXAMINER

CHU, CHRIS C

ART UNIT PAPER NUMBER

2815

DATE MAILED: 11/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/921,070

Applicant(s)

BARRETT, JOSEPH C.

Examiner

Chris C. Chu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16 - 18, 20 - 28 and 30 - 42 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

- 5) ☐ Claim(s) _____ is/are allowed.

- 6) ☒ Claim(s) 16 - 18, 20 - 28 and 30 - 42 is/are rejected.

- 7) ☐ Claim(s) _____ is/are objected to.

- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 17. 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed on August 25, 2003 has been received and entered in the case.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 18 and 28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 18 and 28, it is unclear what the applicant regards as "the extension extending to an edge of the substrate." That is, the limitation of claims 16 and 24, "the extension extends into the corner section of the substrate without extending to an edge of the substrate" precludes the extension from extending to an edge of the substrate. Therefore, the limitations are contradicting each other, hence the claims cannot be understood.

Claim Objections

4. Claims 18 and 28 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. As explained in the paragraph three of this Office

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action, the limitations in claims 18 and 28 which are dependent claims of claims 16 and 24 contradict the limitation in claims 16 and 24.

5. Claim 27 is objected to because of the following informalities: “comer” [Sic: corner].

Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 16, 17, 18, 20, 24, 25, 28, 30, 34, 35, 38 and 39 are rejected under 35

U.S.C. 102(b) as being anticipated by Murakami.

Murakami discloses in Fig. 4 and Fig. 5 an apparatus comprising:

- a substrate (17);
- a chip (11) mounted on the substrate; and
- a mold cap (14) disposed over the substrate such that the mold cap at least partially covers the chip.

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- the mold cap having a plurality of rib-structure extensions (13) extending into each corner section of the substrate (see e.g. Fig. 5),
- the extension extends into the corner section of the substrate without extending to an edge of the substrate.
- the mold cap (14) has chamfered edges (Fig. 3 and 5).

Regarding claims 18 and 28, insofar as definite, the claims are anticipated under the alternative interpretation that the ring part 12 constitutes a part of the extension part 13.

8. Claims 26, 27, 36 and 37 are rejected under 35 U.S.C. 102(b) as being anticipated by Tokuno.

Tokuno discloses in Fig. 1A and Fig. 1C an apparatus comprising:

- a substrate (2);
- a chip (1) mounted on the substrate; and
- a mold cap (15) disposed over the substrate such that the mold cap at least partially covers the chip.
- the mold cap having a plurality of extensions (21) extending into each corner section of the substrate (see e.g. Fig. 1A),
- the extension extends into the corner section of the substrate without extending to an edge of the substrate.
- each extension being a rounded corner of the mold cap structure (Fig. 1A).

Furthermore, applicant's previously-filed affidavit (paper # 12) does not evidence that

applicant had envisioned “rounded corners” nor “extensions not extending to the edge” as early as the April 22, 1997 filing date of Tokuno.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 21, 22, 31, 32, 40 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami in view of the applicant's prior art.

Murakami discloses the claimed invention except for a plurality of solder balls on a surface of the substrate opposite the mold cap and the plurality of solder balls on the surface of the substrate in an area directly opposite a chip. However, the applicant's prior art teaches in Fig. 1B a plurality of solder balls (20) on a surface of a substrate (14) opposite the mold cap and plurality of solder balls (20) on the surface of the substrate (14) in an area directly opposite a chip. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify Murakami by using the plurality of solder balls as taught by the applicant's prior art. The ordinary artisan would have been motivated to modify Murakami in the manner described above for at least the purpose of electrically connecting the substrate to a further substrate, such as a PCB, as taught by the prior art.

11. Claims 23, 33 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami and the applicant's prior art as applied to claims 16, 21, 24, 31, 34 and 40 above, and further in view of Tokita et al. (U.S. Pat. No. 5, 732, 465).

Murakami, as modified, discloses the claimed invention except for all solder balls on the surface of the substrate being spaced from areas directly opposite an edge of the chip. However, Tokita et al. discloses in Fig. 19 all solder balls (30) on the surface of the substrate (10) being spaced from areas directly opposite an edge of the chip (20). Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to further modify Murakami by using the plurality of solder balls as taught by Tokita et al. The ordinary artisan would have been motivated to further modify Murakami in the manner described above by Tokita depending only upon conventional design considerations --such as the desired ball pitch/spacing and associated wiring/pad density-- of the particular BGA application intended.

Response to Arguments

12. Applicant's arguments filed on August 25, 2003 have been fully considered but they are either moot in light of the new grounds of rejection or are not persuasive.

On page 8, applicant argues "a ring part made of a resin and surrounding the semiconductor device body ... so that the semiconductor device body is supported by the ring part via the connecting parts (Murakami Summary, col. 2, lines 25 – 33). As a result of Murakami failing to disclose or suggest applicant's claimed limitations, Murakami does not anticipated applicant's independent claims 16, 24 and 34." This argument is not persuasive. Applicant should note that the claims are open ended due to the term "comprising." Therefore,

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whether Murakami discloses additional structure (the ring part 12) or not is irrelevant since Murakami clearly discloses column 5, lines 12 - 16 to form the ring part 12, the connecting parts 13 and the resin package 14 by independent molding processes. In other words, the ring part 12 may be interpreted as being an additional resin structure and not a part of the combination of the resin package 14 and the connecting parts 13.

For the above reasons, the rejection is maintained.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris C. Chu whose telephone number is (703) 305-6194. The examiner can normally be reached on M-F (10:30 - 7:00).

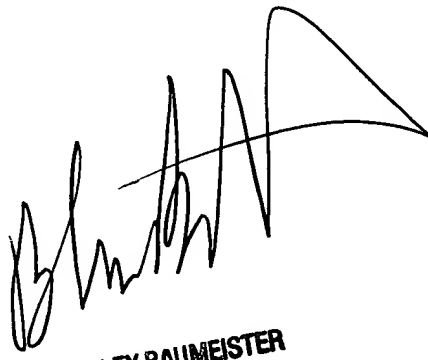
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Chris C. Chu
Examiner
Art Unit 2815

c.c.
11/5/03 5:53:39 PM



BRADLEY BAUMEISTER
PRIMARY EXAMINER